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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

JOHNSON, TIMOTHY M

ART UNIT PAPER NUMBER

2625

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17

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/390,255

Applicant(s)

ACHARYA ET AL.

Examiner

Timothy M Johnson

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 16-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Part III Detailed Action

CPA - Continued Prosecution Application

1. The request filed on February 26, 2003 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/390,255 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Objections

2. Claim 24 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form.

Claim 24 does not further limit claim 23 from which it depends.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 16-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

For claims 16, 23, and 29, lines 5, 5, and 7 respectively, "the associated bits" lacks antecedent basis.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 16-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kolarov et al., 6,144,773, in view of Zandi et al., 6,222,941.

As a general note to the claims, especially independent claims 16, 23, and 29, exemplary claim 29 recites (16 and 23 recite equivalent language) "for each said bit order, code the associated bits to indicate zerotree roots". One should not be confused into thinking that each bit order of the wavelet coefficients must or will indicate zerotree roots, because in zerotree coding, the zerotree root is only one type of attribute in zerotree coding. Thus, the claims should not be unnecessarily narrowly interpreted, for without a broad interpretation of these claims, there would clearly be enablement issues. See the Applicant's specification with respect to the different possible types of zerotree attributes in at least the first full paragraphs on pages 5-6.

For claim 29, a computer system comprising a processor and a memory storing a program to cause the processor perform wavelet compression is provided by Kolarov in at least the abstract for wavelet compression, and c. 7, line 34 – c. 8, line 27 for a processor and memory.

The wavelet compression of Kolarov provides for the claim as follows:

Kolarov provides wavelet coefficients that indicate an image in the third and fourth full paragraphs in c. 12, where Kolarov explicitly recites processing an image, and block 309 of Fig. 3a explicitly recites bitplanes, which are what make up an image, and wavelet coefficients thereof is explicitly recited by Kolarov in at least block 320 in Fig. 3a. Each wavelet coefficient represented by ordered bits so that each bit representing the coefficient is associated with a bit order is provided by Kolarov in at least c. 19, line 19 – c. 20, line 13, where it is clear that the wavelet coefficients are ordered by at least bitplane significance.

For each said bit order, code the associated bits to indicate zerotree roots that are associated with the bit order is not explicitly recited by Kolarov, but Kolarov clearly does provide for coding associated bits for each bit order in at least Figs. 4a-4c and c. 20, line 14 – c. 21, line 33, where each bit, ordered by at least significance, is coded using an algorithm "analogous to Algorithm II of Said-Pearlman". The process of determining significance is a central part in determining zerotree attributes in any zerotree coding method. It is noted that this reference is

incorporated by reference into Kolarov in the last full paragraph in c. 8, which is an extended technique of the zerotree algorithm of Shapiro. Zandi also cites, similar to Kolarov, and uses a modification of the zerotree method of Shapiro in at least the fourth and fifth full paragraphs in c. 23. See at least the second and third full paragraphs in c. 23 of Zandi for the similarities of the zerotree attributes. Not only is Zandi considerably analogous to the Applicant's invention and Kolarov, Zandi further, like the Applicant and Kolarov, classifies zerotree attributes on a bit basis as considerably detailed in the previous Office actions, and again, for example, in at least the third full paragraph in c. 24, the paragraph bridging cols. 24-25, and the last full paragraph in c. 25, where Zandi clearly determines zerotree roots on a bit basis contrary to the Applicant's arguments. It would've been obvious to one having ordinary skill in the art at the time the invention was made to indicate zerotree roots, as taught by Zandi, with the zerotree compression of Kolarov, because it should be clear based on the above analysis that both Zandi and Kolarov rely on the basic zerotree coding algorithm, which determines, inter alia, zerotree roots, and further because Zandi offers many advantages, such as "efficiently" coding the significance data with the zerotree method (c. 23, second full paragraph), "an ordering which preserves the tree structure is fixed and used consistently" (c. 24, second full paragraph), coding based on bit significance, and further provides for a termination test for determining whether a desired compression ratio is reached in the first full paragraph in c. 25.

For claim 30, wherein each bit of each coefficient is associated with a different bit order should be clear from the rejection of claim 23, where the orders of at least bitplanes are distinct.

For claim 31, determining which of the bits indicate zeros is provided by both Kolarov and Zandi where cited above for claim 23, and classifying each zero as either an isolated zero or a zerotree root is considered implicitly provided by Kolarov, and explicitly by Zandi where cited above for claim 23.

For claim 32, wherein some of the wavelet coefficients are descendants of some of the other wavelet coefficients is already provided by the zerotree concept and explicitly by Kolarov in

at least the last full paragraph in c. 19, and also by Zandi where cited above, and wherein the processor determines which of the bits are zeros by traversing a descendant tree from a bit associated with one of the some of the wavelet coefficients to bit associated with the other wavelet coefficients to locate the zerotree root is indicated by Kolarov above with respect to claim 23, where each bit is tested for significance, which is basic concept in zerotree coding to determine zerotree attributes. See also the rejection of claim 23 with respect to Zandi, who explicitly provides for the zerotree roots, and traverses the tree with respect to bits, and see Zandi also in at least the paragraph bridging cols. 22-23, the second full paragraph in c. 24 and the last two full paragraphs in c. 24, where it should be clear that the tree is traversed, since the children are determined for significance only after the parents (i.e. tree traversal) as is part of conventional zerotree coding.

For claim 33, providing the wavelet coefficients by producing different levels of the code, each level being associated with a different reference of the image is basically provided by the concept of the wavelet transform simply illustrated by Kolarov in at least the third full paragraph in c. 9. It is noted that Kolarov uses a modified tree of coefficients in block 362 in Fig. 3b, but it is still a tree, and therefore hierarchical in resolution, as indicated in at least the last two full paragraphs in c. 17. Zandi was used above for the explicit recitation of zerotree roots, and also produces, inter alia, zerotree root attributes as part of the wavelet codes, and it is clear that these codes cover different resolutions, since the wavelet coefficient tree is coded using the parent root down in resolution to the children/descendents where cited above.

For claim 16, see the rejection of at least claim 29.

For claims 17 and 23-24, see the rejection of at least claim 30.

For claims 18 and 25, see the rejection of at least claim 31.

For claims 19 and 26, see the rejection of at least claim 32.

For claims 20 and 27, see the rejection of at least claim 33.

For claims 21 and 28, wherein the levels that are associated with lower resolution are associated with higher orders is understood provided by the hierarchical concept indicated in at least the third full paragraph in c. 9 of Kolarov, because the coarse, i.e. lower resolution, is associated at the highest level or order in the tree, while the finer resolutions are associated with the lower levels in the tree. See also Zandi in at least the last full paragraph in c. 14 for the same well known concept.

For claim 22, providing wavelet coefficients comprises providing intensity level coefficients that indicate pixel intensities of the image is clearly provided by Kolarov in at least the first and fourth through the last full paragraphs in c. 12, which indicate different an image as an example, where color/gray scale for example provide for intensity levels of pixels. Transforming the intensity level coefficients into wavelet subbands is provided by Kolarov in at least the second through the fourth full paragraphs in c. 13, for the wavelet transform, and subbands are explicitly recited for example in the first and second full paragraphs in c. 16 with reference to HH or HL for example, which are specific subbands. See also at least c. 14, lines 15-64 of Zandi, where subbands are explicitly recited.


Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy M. Johnson whose telephone number is (703) 306-3096, or the Supervisory Patent Examiner, Bhavesh M. Mehta, whose telephone number is (703) 308-5246.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone numbers are (703) 305-4700 or (703) 305-4750, or Customer Service at (703) 306-0377.

The Group Art Unit FAX number is 703-872-9314.

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Timothy M. Johnson
Patent Examiner
Art Unit 2625
May 04, 2003


TIMOTHY M. JOHNSON
PRIMARY EXAMINER